

What is claimed is:

1        1. A lithium ion secondary battery comprising:  
2              a positive electrode having a positive electrode  
3              collector and a positive electrode active material layer formed  
4              on said positive electrode collector ;  
5              a negative electrode having a negative electrode  
6              collector and a negative electrode active material layer formed  
7              on said negative electrode collector;  
8              a separator which is arranged between said positive  
9              electrode and negative electrode and keeps a lithium ion-  
10          containing electrolytic solution; and  
11          a porous adhesive resin layer which bonds said  
12          positive electrode active material layer and said negative  
13          electrode active material layer to said separator and keeps said  
14          electrolytic solution to mutually connect said positive electrode,  
15          separator and negative electrode electrically.

1        2. The lithium ion secondary battery according to claim  
2        1 wherein hole ratio of said porous adhesive resin layer is equal  
3        to or larger than that of the separator.

1        3. The lithium ion secondary battery according to claim  
2        2 wherein hole ratio of said porous adhesive resin layer is more  
3        than 35%.

1           2. The method of fabricating a lithium ion secondary  
2 battery according to claim 8 wherein said adhesive resin solution  
3 contains 3-10 parts by weight of a fluoride resin or a mixture  
4 containing a fluoride resin as the main component in N-  
5 methylpyrrolidone.

1           3. The method of fabricating a lithium ion secondary  
2 battery according to claim 8 wherein said step of evaporating  
3 comprises a step of heating.

1           4. The method of fabricating a lithium ion secondary  
2 battery according to claim 8 wherein said step of coating  
3 comprises a step of coating by using a bar coator.

1           5. The method of fabricating a lithium ion secondary  
2 battery according to claim 8 wherein said step of coating  
3 comprises a step of coating by using a spray gun.

1           6. The method of fabricating a lithium ion secondary  
2 battery according to claim 8 wherein said step of coating  
3 comprises a step of dipping the separator in an emulsified  
4 solution of the adhesive resin and then pulling it up.

1           4. The lithium ion secondary battery according to claim  
2       1 wherein the ionic conduction resistivity of said adhesive resin  
3       layer in which the electrolytic solution is kept is equal to or  
4       lower than the ionic conduction resistivity of said separator in  
5       which the electrolytic solution is kept.

1           5. The lithium ion secondary battery according to claim 1  
2       wherein a bonding strength between the positive electrode active  
3       material layer and the separator is equal to or larger than the  
4       bonding strength between said positive electrode active material  
5       layer and the positive electrode collector, and the bonding  
6       strength between the negative electrode active material layer and  
7       said separator is equal to or larger than the bonding strength  
8       between said negative electrode active material layer and the  
9       negative electrode collector.

1           6. The lithium ion secondary battery according to claim  
2       1 wherein the adhesive resin layer is made of a fluoride resin  
3       or a mixture which comprises a fluoride resin as the main  
4       component.

1           7. The lithium ion secondary battery according to claim  
2       6 wherein the fluoride resin is polyvinylidene fluoride.

1           8. A method of fabricating a lithium ion secondary battery,

2 comprising the steps of:

3 preparing a positive electrode by forming a positive  
4 electrode active material layer on a positive electrode  
5 collector;

6 preparing a negative electrode by forming a negative  
7 electrode active material layer on a negative electrode  
8 collector;

9 preparing an adhesive resin solution, by dispersing a  
10 fluoride resin or a mixture containing a fluoride resin as the  
11 main component in N-methylpyrrolidone;

12 coating said adhesive resin solution to at least one of  
13 the surface of the positive electrode active material layer and  
14 the facing surface of the separator and to at least one of the  
15 —surface of the negative electrode active material layer and the  
16 facing surface of the separator;

17 fitting the positive electrode active material layer and  
18 the negative electrode active material layer upon respective  
19 surfaces of said separator;

20 evaporating said N-methylpyrrolidone from said adhesive  
21 resin solution to form porous adhesive resin layers so as to bond  
22 the positive electrode active material layer and the negative  
23 electrode active material layer upon respective surfaces of said  
24 separator to form a laminated body; and

25 supplying a lithium ion-containing electrolytic solution  
26 to said laminated body.